



ABSTRACT

Provided herein are exemplary embodiments of an efficient pump apparatus. In one embodiment the pump apparatus comprises a piston assembly loosely disposed within a cylinder. The piston assembly includes a driving cable connecting a top leaky piston and a bottom leaky piston having a check valve connected thereto. The cylinder includes an outlet pipe at an upper portion thereof and a check valve located at a lower end of the cylinder. The pistons move in the cylinder at a velocity relative to the conduit such that as the pistons move along the cylinder they create a substantial tortuous leak path forming a hydrodynamic seal between the pistons and the cylinder.